

## PATENT COOPERATION TREATY

PCT



## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P 001 819 PC	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/EP2004/002614	International filing date (day/month/year) 12.03.2004	Priority date (day/month/year) 12.03.2004	
International Patent Classification (IPC) or national classification and IPC INV. H04L29/08			
Applicant TELEFONAKTIEBOLAGET L.M. ERICSSON (publ) et al			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <ul style="list-style-type: none"> <li>a. <input checked="" type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of 1 sheets, as follows:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li>b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ul>
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>

Date of submission of the demand 09.01.2006	Date of completion of this report 14.07.2006
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# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
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## Box No. I Basis of the report

1. With regard to the **language**, this report is based on
  - the international application in the language in which it was filed
  - a translation of the international application into , which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3(a) and 23.1(b))
    - publication of the international application (under Rule 12.4(a))
    - international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

1-14 as originally filed

### Claims, Numbers

3(part), 4-16 as originally filed  
1, 2, 3(part) received on 09.01.2006 with letter of 09.01.2006

### Drawings, Sheets

1/4-4/4 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**V. Citations and explanations:**

1. Reference is made to the following documents:

**D4:** SALKINTZIS A K ET AL: "WLAN-GPRS INTEGRATION FOR NEXT-GENERATION MOBILE DATA NETWORKS" IEEE WIRELESS COMMUNICATIONS, IEEE SERVICE CENTER, PISCATAWAY, NJ, US, vol. 9, no. 5, October 2002 (2002-10), pages 112-123, XP001132263 ISSN: 1070-9916

**D5:** WO 00/13436 A2 (found after carrying out an additional search, taking into account the arguments presented by the Applicant)

2. After carefully considering the arguments of the Applicant filed with letter of 09.01.2006 it can be agreed with that the combination of documents **D1 and D2** would not render obvious the subject-matter of claim 1.
3. However, the subject-matter of **claim 1** does **not** involve an inventive step (Article 33(3) PCT) taking into consideration the disclosures of document **D4** and document **D5**, the reasons being as follows:

Document **D4** (see in particular Figures 4 and 5) discloses, according to the **main features of claim 1**, an unlicensed-radio access network for connecting a mobile station to a core network portion of a licensed-radio mobile network (see Figure 5), said unlicensed-radio access network including an access controller connected to said core network portion (see "GPRS interworking function (GIF)" in Figure 5), a broadband packet switched network connected to said access controller and having a plurality of access points (see "WLAN access network" in Figure 4), each said access point defining at least part of a mini-cell coverage area and supporting an unlicensed-radio interface permitting communication between mobile stations located within a respective mini-cell and said access controller (see "802.11 X PHY" in Figure 5), wherein

said access controller comprises a first *link control relay* module for relaying packet service frames (see "BSSGP" in Figure 5), and

a second *transport protocol* module (see "802.3 MAC" in Figure 5), wherein the unlicensed-radio access network comprises:

a third link control module arranged between said first and second modules for receiving packet service frames from said first link control relay module (see paragraph "WLAN Adaptation Function"; "WAF" in Figure 5; Figure 6).

The subject-matter of claim 1 differs from that disclosed in document **D4** merely in that the third link control module of the unlicensed-radio access network of claim 1 in addition comprises "determining a transmission priority assigned to each packet frame and forwarding said packet service frames to said second transport protocol module in an order corresponding to said assigned transmission priority".

However, these distinguishing features represent simple design details which are derivable from the disclosure of document **D4**. In this respect, it should be noted that the "third link control module" (i.e. the WAF - Wireless Adaptation Function) of the "access controller" (i.e. the GIF - GPRS interworking function) of document **D4** supports QoS by implementing transmission scheduling in the access controller (see in particular page 118, right-hand-column, line 16 to page 119, left-hand-column, line 9; Figure 6).

The QoS support by "transmission scheduling" implies "determining a transmission priority assigned to each packet frame" to be forwarded to a second transport protocol module depending on its associated QoS, and also implies "forwarding said packet service frame to said second transport protocol module in an order corresponding to said assigned transmission priority", having regard to the normal knowledge of the person skilled in the field of mobile/wireless communications and related mechanisms for the prioritisation and scheduling of packets in an unlicensed-radio access network. Such normal knowledge is represented e.g. by document **D5** (see in particular page 15, line 16 to page 17, line 7; page 24, line 3 to page 25, line 7; page 53, lines 3-9), wherein a third link control module (i.e. WFMP - Wireless Flow Management Protocol) is implemented in an access controller (i.e. M-router) of an unlicensed-radio access network which determines a transmission priority assigned

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to each packet frame and forwards said packet service frames to said second transport protocol module in an order corresponding to said assigned transmission priority.

The skilled person, being aware of the unlicensed-radio access network described in document **D4** and wishing to further provide implementation details on the prioritisation and forwarding of packets in a third layer/module located between a first and a second layer of an access controller, **would** therefore arrive, by explicitly including these design details which are already derivable from document **D4** and comprised in the normal knowledge of the skilled person (see document **D5**) in the unlicensed-radio access network of document **D4**, **without** the exercise of inventive skill, at the unlicensed-radio access network to the subject-matter of claim 1.

The subject-matter of claim 1 therefore does **not** involve an inventive step, Article 33(3) PCT.

4. The same considerations as stated in above paragraph 3 regarding inventive step of the subject-matter of claim 1 are also valid for **independent claim 9**, since said claim is based on the **same principle** as claim 1 in terms of a mobile station.

It should be noted that the distinguishing feature of claim 9, i.e. a "mobile station" instead of an access controller, is also disclosed in document **D4** (see in particular page 118, right-hand-column, lines 16-17; Figures 5 and 6).

The subject-matter of independent claim 9 does **not** involve an inventive step, Article 33(3) PCT.

5. Moreover, the same considerations as stated in above paragraph 3 regarding inventive step of the subject-matter of claim 1 are also valid for **independent claim 12**, since said claim is based on the **same feature combination** as claim 1 in terms of a method in an unlicensed-radio access network.

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The subject-matter of independent claim 12 does **not** involve an inventive step,  
Article 33(3) PCT.

6. **Dependent claims 2-8, 10, 11 and 13-16 do not** contain any additional features which, in combination with the features of the claim to which they refer, involve an inventive step for the reason that the subject-matter of said claims is derivable from the disclosure of document **D5** (for **claims 2 and 10**: see in particular page 16, lines 14-25; page 53, lines 3-13; Figure 28; for **claims 5 and 15**: see in particular page 12, lines 19-25), **or** represents common design details which are well-known to the person skilled in the field of mobile/wireless communications and related mechanisms for the prioritisation and scheduling of packets in an unlicensed-radio access network (see e.g. document **D2**: for **claims 3, 11 and 13**: see in particular page 4, line 32 to page 5, line 25).

Due to the above reasons, the subject-matter of dependent **claims 2-8, 10, 11 and 13-16 do not** involve an inventive step, Article 33(3) PCT.

**VII. Certain defects in the international application:**

7. The independent claims 1, 9 and 12 are not correctly cast in the **correct two-part form**, with those features which in combination are part of the nearest prior art (i.e. document **D4**) being placed in the preamble, Rule 6.3(b) PCT.
8. The claims (preamble and characterising portion) do not contain **reference signs** in parentheses, Rule 6.2(b) PCT.
9. The cited documents **D4 and D5**, which represent the **relevant state of the art** with regard to the present application, are not acknowledged and briefly discussed in the opening part of the description, Rule 5.1(a)(ii) PCT.

P001 819 PC/HG

## Claims:

- 5        1. An unlicensed-radio access network for connecting a mobile station to a core network portion of a licensed-radio mobile network, said unlicensed-radio access network including an access controller connected to said core network portion, a broadband packet-switched network connected to said access controller and having a plurality of access points, each said access point defining at least part of a mini-cell coverage area and supporting an unlicensed-radio interface permitting communication between mobile stations located within a respective mini-cell and said access controller, wherein said access controller comprises a first link control relay module (35) for relaying packet service frames and a second transport protocol module (32, 33), characterised by comprising a third link control module (34) arranged between said first and second modules for receiving packet service frames from said first link control relay module (35) determining a transmission priority assigned to each packet frame and forwarding said packet service frames to said second transport protocol module (32, 33) in an order corresponding to said assigned transmission priority.
- 10      2. An access network as claimed in claim 1, further characterised in that said third link control module (34) comprises a plurality of buffers (110) for storing said packet service frames, each buffer corresponding to a specific transmission priority and being adapted to receive packet service frames of the specific transmission priority only.
- 15      3. An access network as claimed in claim 2, further characterised in that said third link control module (34) is further adapted to determine an acknowledgement mode of a packet service frame and to store a packet
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- 25
- 30